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Stated Meeting, November 1st, 1861.

Present, twelve members.

Professor CRESSON, Vice-President, in the Chair.

Donations for the Library were announced from the Rhode Island Society for the Encouragement of Domestic Industry, the Academy of Natural Sciences of Philadelphia, the editors of the Medical News and Library, the Superintendent of the United States Coast Survey, and Prof. E. O. Kendall.

The committee to which was referred the communication of Dr. Mitchell reported in favor of its publication in the Transactions, and it was so ordered.

Dr. Coates gave a specific reference to Jefferson's correspondence in reference to a point of the discussion at the last meeting.

Mr. Powel made some remarks upon the progress of the flax-cotton manufacture in New England and New York, for which the chief desideratum has been a uniform staple, which seems now attainable by passing the fibres between rolls under graduated pressure.

Pending nominations Nos. 425 and 426 were read.

On motion of Dr. Bache an appropriation was made for printing the paper book of the Society in the case now before the court, argued by Mr. Price.

And the Society was adjourned.

Stated Meeting, November 15th, 1861.

Present, fifteen members.

Professor CRESSON, Vice-President, in the Chair.

Prof. Brown of Heidelberg, lately elected a member of the Society, made known his acceptance of membership through the President, Dr. Wood, whose letter to the Secretary, dated Copenhagen, Oct. 16, 1861, was read.

Letters acknowledging the receipt of publications were read

from the Natural History Society at Moscow, dated Dec. 15-27, the London Ethnological Society, dated March 20, the National Museum of Antiquaries at Edinburgh, dated April 13, and the Smithsonian Institution, dated Washington, May 9, and June 28, 1861.

Donations for the Library were received from the Smithsonian Institution, the Franklin Institute, the Protestant Episcopal Church of Pennsylvania, Dr. Tafel, Professor Tafel, of St. Louis, Mr. Lea, Mr. Foulke, and Dr. Emerson.

Copies of the paper book were laid upon the table by Mr. Price.

The death of M. VON ABRAHAMSON, of Copenhagen, January 6, 1849, was announced.

Dr. Emerson called the attention of the members to the importance of phosphoric acid in agriculture.

The agency exercised by phosphoric acid upon growing plants has been one of the most important results of the investigations of men of science, who have devoted their attention to organic chemistry and its bearings upon agriculture. Baron Liebig has thrown out the most interesting information upon the subject, and Elie de Beaumont has made a rich communication to the National Institute of France, upon the agricultural value of phosphoric acid. He regards this as the main element imparting fertility to soils, and its withdrawal from these in the products of agriculture, and subsequent concretion into the bones of animals, as the cause of sterility. He refers to countries once abundant in cereal products and teeming in population, such as Sicily and Syria, as owing their present desolation to the abstraction of phosphoric acid by the products of the surface soil, which acid subsequently enters into the bony frames of animals. The bones of man are buried deep under ground, beyond the reach of growing plants, whilst those of the inferior animals are scattered far away from the places where they were formed. He even makes a calculation of the number of tons of phosphoric acid removed from the soil of France, since the period when its lands were wrested from the rude Celts, and subjected to civilization and culture. The grand result which he arrives at is, that the amount is not less than two millions of tons of phosphate of lime, drawn from the soil in its surface products, and concreted into human bones.

The revelations of science in the laboratory have been well tested

in the field, and perhaps by no one in this country on a scale so extensive as by myself, having for many years past applied from thirty to forty tons a year of concentrated fertilizers abounding in phosphates, on farms which I cultivate, in Kent County, Delaware. These were in a very impoverished condition when I began to apply concentrated fertilizers, the bases of which are phosphates of lime. The particular preparation I use has the bone-earth brought into a soluble state by chemical agency. The soluble phosphate has a sufficient amount of ammonia, with other fertilizing elements, to meet all the requisitions of growing plants in every stage of their development. By such applications I have obtained results in the highest degree satisfactory, in proof of which, I am able to state that in from two to four years' time, I have brought up land so as to yield three and four times what it could do before the applications were made. The increase in the crops always paid for the outlay in the fertilizer, and thus the increase in the productive value of the land was clear gain. To state one out of many cases tried (some on a much larger scale), a small farm of about one hundred and ten arable acres, was dressed with a good ammoniated superphosphate applied in the successive crops during two years. In its former greatly impoverished condition, it would pay less than \$150 per year, or an interest on \$2500. At the end of two years, after an outlay of about \$800 in the fertilizer, the farm was permanently improved so as to yield a rent of \$600, thus showing that the productive value had been raised from \$2500 to \$10,000.

My extensive use for many years past, of a fertilizer in which soluble phosphate or superphosphate of lime constitutes the basis, has fully established the views taken by scientific men, of the inestimable value of phosphoric acid to increase the productiveness of the soil.

I reckon my agricultural profits as mainly based upon my ability to supply the land with the necessary amount of soluble phosphoric acid. This when once removed is never supplied from natural sources, and consequently, has to be put back by the hand of man. Not so with other fertilizing elements, which, like ammonia, is derived from the atmosphere, whilst the alkaline earths are often supplied by the disintegration of minerals composing the soil. Whilst the farmer rejoices in having obtained the power to derive treble and quadruple profits from his labor, he must bear in mind that for this power, he is under obligations to the brilliant results of scientific investigation.

Various practical questions were put to Dr. Emerson by the members present, to which he replied.

Mr. Foulke referred to the interesting fact, that the presence of phosphorus seems to be a *sine qua non* to life in all its phases, from the thought-life of the brain of man down to the simplest cell-life of the infusorial world.

Dr. Goodwin referred to previous discussions of the subject of the Freedom of the Will, and spoke in proof both of the existence of the faculty and of its freedom.

Mr. Foulke considered the discussion as exhausted long ago by President Edwards, and unserviceable in a day of natural science.

Mr. Lesley advocated the discussion of metaphysical subjects as a philosophic necessity, but urged the harm of a merely logical play with words which have descended to us from a remote antiquity, clothing themselves with traditional meanings on their way.

In this instance an ancient elliptical expression, originally standing for an act or at most for an affection of the soul, was afterwards personified as a power, and has at last entered our philosophical creed as an essence. We discover in the most ancient languages no aboriginal word for will, with a meaning such as the modern bears. There are only words meaning Desire, Intention, Power governmental, Power judicial, Verdict, an attitude of the Soul as an active unit in presence of the surrounding world. Nor have we any direct evidence of the existence of a separate faculty called Will. As to the supposed conflict between the two theories of the determined and self-determining Will, in other words between Free Will and Necessity, it is likely to disappear with the disappearance of the supposed faculty. And in any case, testimony being taken on both sides by Natural History methods, both the freedom of man's responsible soul and its absolute subjection to motives are alike affirmed; nor does there seem to be any rational necessity in deciding for the one, for rejecting the other.

The minutes of the last meeting of the board of officers and members in council were read with the list of nominations recommended.

Mr. Foulke moved that the Committee on the Arctic Expedition under the command of Dr. I. I. Hayes, be requested to invite Dr. Hayes to be present at the next meeting of the

Society, and to give such information as he may deem important in relation to the scientific results of the Expedition. Seconded by Dr. Bache, and the motion was agreed to.

A letter of the President, Dr. Wood, to the Honorable Cassius M. Clay, Minister of the United States at the Court of St. Petersburg, was then read.

And the Society was adjourned.

Stated Meeting, December 6, 1861.

Present, thirty-four members.

Judge SHARSWOOD, Vice-President, in the Chair.

A letter was read from the President, Dr. Wood, dated Breslau, November 4, 1861.

Donations for the Library were announced from the Bureau des Ponts et Chaussées, the London Chemical and Royal Astronomical Societies, the Essex Institute, the American Journal of Science, and Professor Twining, of New Haven, the Medical News, the Academy of Natural Sciences, Professor Trego and Mr. H. C. Carey, of Philadelphia, citizens of Chicago, and booksellers in London and New York.

The committee appointed by the American Philosophical Society in relation to an invitation to Dr. Isaac I. Hayes, reported that they addressed to Dr. Hayes a note, of which the following is a copy :

HALL OF THE AMERICAN PHILOSOPHICAL SOCIETY,
PHILADELPHIA, November 16, 1861.

SIR :

The undersigned, a Committee of the American Philosophical Society, have the pleasure of communicating to you the following resolution of that Society, unanimously adopted at a meeting held on the 15th instant.

“Resolved, that the Committee on the Arctic Expedition, under the command of Dr. Isaac I. Hayes, be requested to invite Dr. Hayes to be present at the next meeting of the Society, and to give such